United States Department of Agriculture

Forest Service

North Central Forest Experiment Station

Research Paper NC-226

The History and Reliability of the USDA Forest Service Wildfire Report

Linda R. Donoghue

USDA - FOREST SERVICE

INDIVIDUAL FIRE REPORT

FIRE NAME

MANDATORY ITEMS: CLASS A 1-33

CLASS B 1-34 CLASS C to G 1-44

1. State [2-3]	2. County	3. Forest [4-5]	4. District [6-7]

6. Fire started on [11]	7. Month [12]	Day [13-14]	Year [15]	8. Watershed No. [16-23]

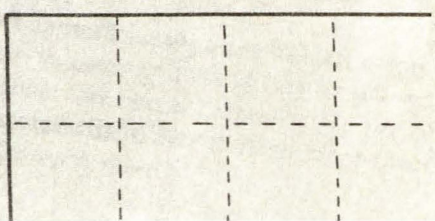
10. Statistical Cause [25]	11. General Cause [26]	12. Specific Cause [27-28]	13. Class

	DATE Mo. Day	HOUR	ELAPSED TIME Hours	Min.
14. Origin			[30-31]	
15. Discovered (Item 15 minus 14)			[32-33]	34-35
16. First attack (Item 16 minus 15)			[36-37]	38-39
17. First Reinforcement (Item 17 minus 16)			[40]	41-42
18. Fire Controlled Item 18 minus 16			[43-45]	
19. Fire Out				

20. Discovered by (Class) | Location	[46]
21. First Attack by |(Kind) |(Amount)	[47-48]
22. First Reinforcements (Kind) |(Amount)	[49-50]
23. Maximum No. Personnel	[51-54]

27. Slope
28. Aspect
29. Elevation
30. Cover type - vicinity of origin
31. Fuel type - vicinity of origin
32. Cost Class
33. Location

Scale: _____ inches = 1 mile



5100-29

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I'm also grateful to Douglas Helms who so graciously and cheerfully helped me locate historical Forest Service fire reports in the National Archives Building, Washington, D.C., and finally to Forest Service District personnel, for their enthusiasm, unceasing support, and cooperation during my visits to their home territory. I hope this study can, in some way, make their jobs a little easier.

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THE HISTORY AND RELIABILITY OF THE USDA FOREST SERVICE WILDFIRE REPORTS

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Wildfire reporting is as old as the USDA Forest Service. Beginning in 1905 with Form 944, fire information has been reported in varying detail under several different formats. This paper briefly traces the history of Forest Service fire report forms, examines both the quantity and quality of information recorded on the current Individual Fire Report, Form 5100-29, and discusses other aspects of the Forest Service wildfire reporting system. This information will be useful to those evaluating and designing wildfire reporting systems. By viewing the patterns of historical development and change that led to the current 5100-29, and by examining factors influencing the quality of data recorded on the form, land managers will have a good foundation on which to base their decisions to change the Forest Service wildfire reporting system.

FIRE REPORT HISTORY

The first Forest Service fire report (Form 944)[1], issued in 1905, required only 15 items of information for each Class B or C[2] fire recorded (fig. 1). Unlike subsequent forms, this initial report had space to report up to four individual wildfires. By 1914 a pocket-size report (Form 874-6) was used to record an individual fire in any size class. Compared to the original form, a more detailed accounting, particularly of suppression costs, acres burned, and timber damage, was required for each wildfire. Although Form 874-6 was probably the first individual fire report (i.e., only one fire was reported per form), Form 929, issued around 1920, was the first to receive the official title **Individual Fire Report** used to this day. Beginning in the 1920's, the information required about a single wildfire increased considerably; form size expanded from 3½ by 6¼ inches in 1914 to 8 by 14 inches in 1920 and to 8 by 16 inches in 1931 (fig. 2). During the 1920's, up to four different individual fire reports were used Forest Servicewide; they were identical except for supplemental fire information recorded under the heading "Studies." Apparently, different research data were recorded for different Forest Service Regions to assess fire-danger in specific areas of the country. In the 1930's "Studies" was replaced with a detailed "Analysis of Action Taken" at the fire scene. This latter supplemental information was primarily responsible for the increased size of the 1930 reports. By this time, too, all of the regions reported the same information on a standardized 929 form, but the amount of information reported depended on the size of the fire. One 929 was required for Class B and C fires and perhaps a different form for Class A fires, although there's no historical record of a Class A fire report.

1940 marked the modern era of fire reporting. The report form issued at this time was the first designed for automated data processing and easy readability (fig. 3). The standard 8- by 10½-inch form was initially used to report all size classes of fires. By 1946, "A" fires were officially reported on a separate form. Beginning in 1950, the amount of information required for wildfires was gradually reduced, and all size classes were reported on one form. The current fire report, containing 44 items, is basically a condensed version of the 1960 form (fig. 4a, 4b).

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[1]*Fire report forms and related correspondence issued by the Forest Service from 1905 to 1959 were obtained from the National Archives Building; Records of the Forest Service (Record Group 95); Records of the Division of Operation (1900-44) and Division of Fire Control (1909-41); Office Copies of Forms (1900-09), Records of the Office of Forest Reserves (1905-7), General Correspondence (1909-37), and Statistical Data (1935-41).*

[2]*Only three fire-size classes were initially reported: Class A (under ¼ acre); Class B (under 10 acres); and Class C (over 10 acres). Apparently no information was reported for Class A fires other than the total number for each month.*

Form 944

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

REPORT OF FIRES FOR THE MONTH OF _____, 190

_____ *Reserve.* _____ *Forest Ranger.*

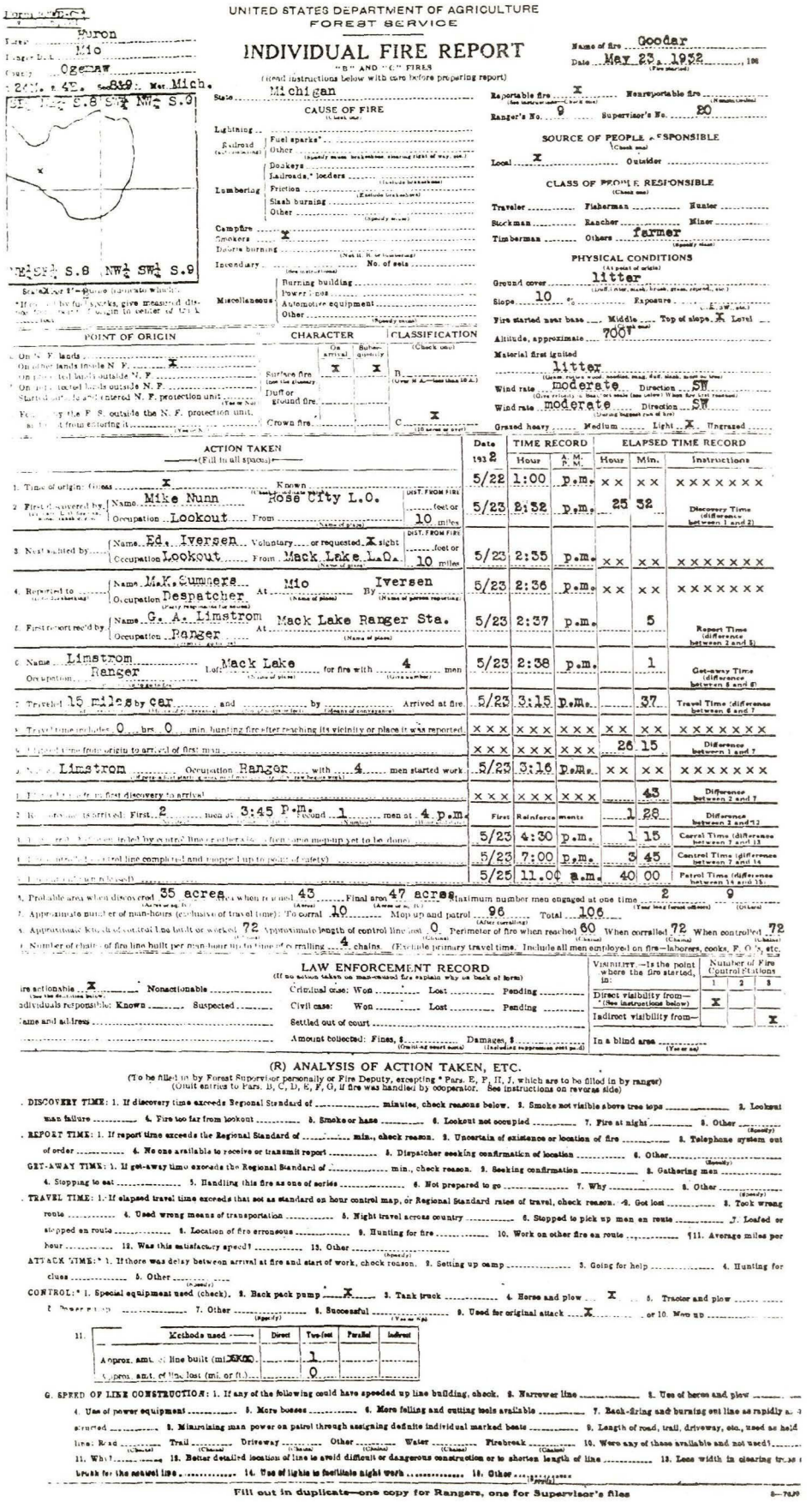
Class (B or C).				
Location.				
Total number of acres burned over.				
Number of acres of timber burned over.				
Amount in feet b. m. timber destroyed. Green				
Dry				
Amount in feet b. m. of timber damaged but not destroyed.				
Value of timber destroyed.				
Amount of damage to timber not destroyed.				
Probable cause.				
Who discovered the fire?				
When discovered?				
When was work on fire commenced?				
When was work finished?				
Number of extra men employed.				
Cost:				
For help				
For materials, tools, etc				
Total cost				

Number of fires of Class "A" extinguished during the month: _____

NOTE.—This report is to be submitted at the end of each month by the Ranger to the Supervisor. If no fires have occurred during the month, so state on this form. Use a separate column for reporting each fire.

In case of a large fire, any additional information necessary for the Forest records should be submitted in a supplementary letter. Report also any work done on fires outside of the Forest.

Figure 1.—*Form 944—the first USDA Forest Service fire report form.*



UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

INDIVIDUAL FIRE REPORT

"B" AND "C" FIRES
(Read instructions below with care before preparing report)

Huron
Mio
Ogemaw
24N. R 4E. Sec. 8 & 9 Mer. Mich.
SE¼ NE¼ S.8 SW¼ NW¼ S.9
NE¼ S.8 NW¼ SW¼ S.9

Name of fire: Goodar
Date: May 23, 1932
State: Michigan
Reportable fire: X Nonreportable fire:
Ranger's No.: 9 Supervisor's No.: 80

CAUSE OF FIRE (Check one)
Lightning
Railroad (Locomotive): Fuel sparks*; Other (Specify more locomotive, referring right of way, etc.)
Lumbering: Donkeys; Railroads,* loaders (Indicate locomotive no.); Friction (Exclude brake shoes); Slash burning; Other (Specify, if any)
Campfire
Smokers: X
Debris burning (Not in R. R. locomotives)
Incendiary (Give motive if known) No. of sets
Miscellaneous: Burning building; Power lines; Automotive equipment; Other (Specify, if any)

SOURCE OF PEOPLE RESPONSIBLE (Check one)
Local: X Outsider

CLASS OF PEOPLE RESPONSIBLE (Check one)
Traveler Fisherman Hunter
Stockman Rancher Miner
Timberman Others: farmer (Specify)

PHYSICAL CONDITIONS (At point of origin)
Ground cover: litter (Leaf, litter, moss, brush, grass, reprod., etc.)
Slope: 10 % Exposure (N., S.W., etc.)
Fire started near base Middle Top of slope: X Level
Altitude, approximate: 700' (Above sea level)
Material first ignited: litter (Grass, reprod., leaf, litter, moss, brush, snag, etc.)
Wind rate: moderate Direction: SW (Give velocity or Beaufort scale (see below) when fire first reached)
Wind rate: moderate Direction: SW (During highest run of fire)
Grazed heavy Medium Light: X Ungrazed

POINT OF ORIGIN
On U. S. F. lands
On other lands inside N. F.: X
On privately owned lands outside N. F.
On privately owned lands outside N. F. which are protected by the Service
Forest protective unit (Name of unit)
For protection by the F. S. outside the N. F. protection unit, as to distance from entering it (Name of unit)

CHARACTER

	On arrival	Subsequently
Surface fire (See the glossary)	X	X
Duff or ground fire		
Crown fire		

CLASSIFICATION (Check one)
B (Over 9 A.—less than 10 A.)
C: X (10 acres or over)

ACTION TAKEN
(Fill in all spaces)

	Date 1932	TIME RECORD Hour	A.M. P.M.	ELAPSED TIME RECORD Hour	Min.	Instructions
1. Time of origin: Guess X Known (Check one)	5/22	1:00	p.m.	XX	XX	XXXXXXX
2. First discovered by: Name Mike Nunn (Rose City L.O.); Occupation Lookout; From (Name of place); DIST. FROM FIRE 10 miles	5/23	2:32	p.m.	25	32	Discovery Time (difference between 1 and 2)
3. Next notified by: Name Ed. Iversen; Occupation Lookout; From Mack Lake L.O.; Voluntary or requested X sight; DIST. FROM FIRE 10 miles	5/23	2:35	p.m.	XX	XX	XXXXXXX
4. Reported to (or by): Name M.K. Cummens; Occupation Despatcher (Forest Supervisor's for fire only); At Mio (Name of place); By Iversen (Name of person reporting)	5/23	2:36	p.m.	XX	XX	XXXXXXX
5. First report rec'd by: Name G. A. Limstrom; Occupation Ranger; At Mack Lake Ranger Sta. (Name of place)	5/23	2:37	p.m.		5	Report Time (difference between 2 and 5)
6. Name Limstrom; Occupation Ranger; Left Mack Lake (Name of place) for fire with 4 men (Give number)	5/23	2:38	p.m.		1	Get-away Time (difference between 5 and 6)
7. Traveled 15 miles by car (Mo. or dist. traveled) and (Means of transportation) by (Means of conveyance) Arrived at fire	5/23	3:15	p.m.		37	Travel Time (difference between 6 and 7)
8. Travel time excludes 0 hrs. 0 min. hunting fire after reaching its vicinity or place it was reported	XXX	XXX	XXX	XX	XX	XXXXXXX
9. Elapsed time from origin to arrival of first man	XXX	XXX	XXX	26	15	Difference between 1 and 7
10. Name Limstrom; Occupation Ranger; with 4 men started work	5/23	3:16	p.m.	XX	XX	XXXXXXX
11. Time lapse, 6 to first discovery to arrival	XXX	XXX	XXX		43	Difference between 2 and 7
12. Reinforcements (if any): First 2 (Number) men at 3:45 p.m. Second 1 (Number) men at 4 p.m.	First Reinforcements			1	28	Difference between 2 and 12
13. Corral (or last reported) line completed by control line or otherwise (if fire still in mop-up yet to be done)	5/23	4:30	p.m.	1	15	Corral Time (difference between 7 and 13)
14. Control line completed and manned (up to point of safety)	5/23	7:00	p.m.	3	45	Control Time (difference between 7 and 14)
15. Fire declared out (or blacked)	5/25	11.00	a.m.	40	00	Patrol Time (difference between 14 and 15)

16. Probable area when discovered 35 acres (Acres or sq. ft.) Area when reported 43 (Acres) Final area 47 acres (Acres or sq. ft.) Maximum number men engaged at one time 2 (Your local forest officers) 9 (Others)
17. Approximate number of man-hours (exclusive of travel time): To corral 10 Mop up and patrol 96 (After corralling) Total 106
18. Approximate kilo. of control line built or worked 72 (Chains) Approximate length of control line cut 0 (Chains) Perimeter of fire when reached 60 (Chains) When corralled 72 (Chains) When controlled 72 (Chains)
19. Number of chains of fire line built per man-hour up to time of corralling 4 chains. (Exclude primary travel time. Include all men employed on fire—laborers, cooks, F. O.'s, etc.

LAW ENFORCEMENT RECORD
(If no action taken on man-caused fire explain why on back of form)

Fire actionable: X (See law on reverse side) Nonactionable
Individuals responsible: Known Suspected
Name and address
Criminal case: Won Lost Pending
Civil case: Won Lost Pending
Settled out of court
Amount collected: Fines, $ (Traveling court men's) Damages, $ (Including suppression cost pd.)

VISIBILITY.—Is the point where the fire started, in:

	Number of Fire Control Stations 1	2	3
Direct visibility from—* (See instructions below)	X		
Indirect visibility from—			X
In a blind area (Yes or no)			

(R) ANALYSIS OF ACTION TAKEN, ETC.
(To be filled in by Forest Supervisor personally or Fire Deputy, excepting * Para. E, F, H, J, which are to be filled in by ranger)
(Omit entries to Pars. B, C, D, E, F, G, if fire was handled by cooperator. See instructions on reverse side)

A. DISCOVERY TIME: 1. If discovery time exceeds Regional Standard of ____ minutes, check reasons below. 2. Smoke not visible above tree tops ____ 3. Lookout man failure ____ 4. Fire too far from lookout ____ 5. Smoke or haze ____ 6. Lookout not occupied ____ 7. Fire at night ____ 8. Other (Specify)
B. REPORT TIME: 1. If report time exceeds the Regional Standard of ____ min., check reason. 2. Uncertain of existence or location of fire ____ 3. Telephone system out of order ____ 4. No one available to receive or transmit report ____ 5. Dispatcher seeking confirmation of location ____ 6. Other (Specify)
GET-AWAY TIME: 1. If get-away time exceeds the Regional Standard of ____ min., check reason. 2. Seeking confirmation ____ 3. Gathering men ____ 4. Stopping to eat ____ 5. Handling this fire as one of series ____ 6. Not prepared to go ____ 7. Why (Specify) 8. Other (Specify)
C. TRAVEL TIME: 1. If elapsed travel time exceeds that set as standard on hour control map, or Regional Standard rates of travel, check reason. 2. Got lost ____ 3. Took wrong route ____ 4. Used wrong means of transportation ____ 5. Night travel across country ____ 6. Stopped to pick up men en route ____ 7. Loafed or stopped en route ____ 8. Location of fire erroneous ____ 9. Hunting for fire ____ 10. Work on other fire en route ____ 11. Average miles per hour ____ 12. Was this satisfactory speed? ____ 13. Other (Specify)
D. ATTACK TIME: 1. If there was delay between arrival at fire and start of work, check reason. 2. Setting up camp ____ 3. Going for help ____ 4. Hunting for clues ____ 5. Other (Specify)
E. CONTROL: 1. Special equipment used (check). 2. Back pack pump X 3. Tank truck ____ 4. Horse and plow X 5. Tractor and plow ____ 6. Power pump ____ 7. Other (Specify) 8. Successful (Yes or No) 9. Used for original attack X or 10. Were up ____

11.

Methods used	Direct	Two-foot	Parallel	Indirect
Approx. amt. of line built (mi. or ft.)		1		
Approx. amt. of line lost (mi. or ft.)		0		

G. SPEED OF LINE CONSTRUCTION: 1. If any of the following could have speeded up line building, check. 2. Narrower line ____ 3. Use of horses and plow ____ 4. Use of power equipment ____ 5. More horses ____ 6. More felling and cutting tools available ____ 7. Back-firing and burning out line as rapidly as scorched ____ 8. Minimizing man power on patrol through assigning definite individual marked beats ____ 9. Length of road, trail, driveway, etc., used as held line: Road (Chains) Trail (Chains) Driveway (Chains) Other (Chains) Water (Chains) Firebreak (Chains) 10. Were any of these available and not used? ____ 11. Why? ____ 12. Better detailed location of line to avoid difficult or dangerous construction or to shorten length of line ____ 13. Less width in clearing trail brush for the control line ____ 14. Use of lights to facilitate night work ____ 15. Other (Specify)

Fill out in duplicate—one copy for Rangers, one for Supervisor's files

8—7639

Figure 2.—*Front of the Forest Service Individual Fire Report, Form 929, used for Class B and C fires during the 1930's. Up to 700 entries were possible on this 8- x 16-inch form.*

Form 929
Revised
October, 1939

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

INDIVIDUAL FIRE REPORT

ALL CLASSES OF FIRES

Ranger District _____

Regional Fire Number _____

1 IDENTIFICATION	Code Nos.	Col. Nos.
a. Name of fire:		
b. Ranger's fire number:		
c. Twp: ____ R. ____ S. ____ Mer.		
d. Region		1
e. Forest:		2-3
f. Supervisor's fire number:		4-7
g. Year discovered		8
h. Month discovered:		9
i. Day discovered:		10-11
j. State:		12
k. County		13
l. Ranger district:		14

2 CLASS OF FIRE	Code Nos.	Col. Nos.
		15

3 CAUSE OF FIRE	Code Nos.	Col. Nos.
a. General:		16
b. Specific:		17-18
c. Class of people:		19
d. Reason:		

4 FIRE STARTED ON	Code Nos.	Col. Nos.
		20

5 TIME	Date	Hour	A.M P.M	ELAPSED TIME Hour	ELAPSED TIME Min.	Code Nos.	Col. Nos.
guess: (____) a. Origin known: (____)							21
b. Discovered:							22-23
				(b-a)			
c. Reported:							24
				(c-b)			
d. First attack:							25-26
				(d-c)			
e. 1st. reinforcements:							27-28
				(e-d)			
f. 2nd. reinforcements:							
				(f-e)			
g. Max. no. line workers:							
				(g-c)			
h. Max. no. men mobilized:							
				(h-c)			29-31
i. Fire controlled:							
				(i-d)			32-34
j. Fire mopped up:							
				(j-i)			
k. Fire out:							

6 PHYSICAL CONDITIONS	Code Nos	Col. Nos
a. Pt. of origin in seen area from O-1-2-3 L.O. Sta. (_____) (_____) (occupied) (not occupied)		35
b. Visibility rating: _____ (miles)		36
c. Discovery distance: _____ (miles)		37
d. Danger rating class: _____ (regional symbol)		38-39
e. Wind velocity at time of first attack: _____ (miles)		40-41
f. Wind velocity at time of greatest run: _____ (miles)		42-43
g. Timber type at point of origin: _____ (regional symbol)		44-45
h. Fuel type at point of origin: _____ (regional symbol)		46-47
i. Worst fuel type on area: _____ (regional symbol)		48-49
j. Exposure:		50
k. Elevation above sea-level: _____ (feet)		51
l. Slope: _____ (percent)		52

7 BEHAVIOR OF FIRE	Code Nos.	Col. Nos.
a. Character of fire on arrival:		53
b. Area when discovered:		54-55
c. Area on arrival:		56-57
d. Area when controlled: (_____) (_____) (N.F. and other inside) (outside)		58-62
e. Perimeter in chains at first attack:		63-64
f. Perimeter in chains when controlled:		65-67
g. Av. chains perimeter increase per hour origin to attack:		68

8 ACCESSIBILITY AND MAN POWER	Code Nos.	Col. Nos.
a. Regular action: (_____), Independent action: (_____)		69
b. Disc. by: _____ (class of discoverer) _____ (location)		70
c. Rprtd. to: _____ (name) _____ (location)		
d. No. men in 1st. attack: (_____), Boss: _____ (name)		71-72
e. No. men in 1st. reinforcements:		73-74
f. No. men in 2nd. reinforcements:		
g. Max. no. of line workers:		
h. Max. no. of men mobilized:		
i. Miles traveled by road by initial attack force:		75-76
j. Miles traveled by trail by initial attack force:		77-78
k. Miles traveled cross country by initial attack force:		79

Figure 3.—*Front of the 1940 Forest Service Individual Fire Report, Form 929. This was the first form designed for automated data processing.*

USDA - FOREST SERVICE

INDIVIDUAL FIRE REPORT

FIRE NAME

RANGER FIRE NO.

MANDATORY ITEMS: CLASS A 1-33 CLASS B 1-34 CLASS C to G 1-44

REGION FIRE NO.

1. State [2-3]	2. County	3. Forest [4-5]	4. District [6-7]	5. Supervisor No. [8-10]

6. Fire started on [11]	7. Month [12]	Day [13-14]	Year [15]	8. Watershed No. [16-23]	9. Size Class [24]

10. Statistical Cause [25]	11. General Cause [26]	12. Specific Cause [27-28]	13. Class of people [29]

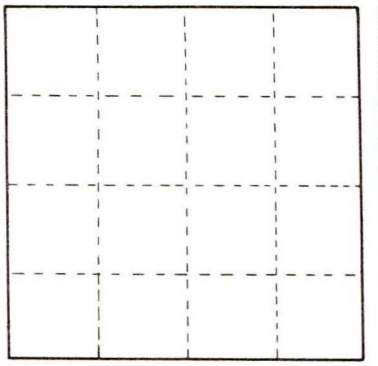
	DATE Mo. Day	HOUR	ELAPSED TIME Hours	Min.
14. Origin			[30-31]	
15. Discovered (Item 15 minus 14)			[32-33]	[34-35]
16. First attack (Item 16 minus 15)			[36-37]	[38-39]
17. First Reinforcement (Item 17 minus 16)			[40]	[41-42]
18. Fire Controlled Item 18 minus 16			[43-45]	
19. Fire Out				

20. Discovered by (Class) | Location	[46]
21. First Attack by |(Kind) |(Amount)	[47-48]
22. First Reinforcements (Kind) |(Amount)	[49-50]
23. Maximum No. Personnel	[51-54]
24. Value Class at Origin	[55]
25. Fire danger	[56-57]
26. Special Weather feature	[58]

27. Slope	[59]
28. Aspect	[60]
29. Elevation	[61]
30. Cover type - vicinity of origin	[62-63]
31. Fuel type - vicinity of origin	[64-69]
32. Cost Class	[70]

33. Location

Scale: _____ inches = 1 mile



Location description

a. Township	[71-74]
b. Range	[75-78]
c. Section	[79-80]
d. Meridian	

Alternate description for lands not covered by GLO survey

e. Latitude	[72-75]
f. Longitude	[76-80]

34. Acres burned	NATIONAL FOREST LANDS	OTHER LANDS INSIDE
a. Noncommercial forest	[11-16]	[17-21]
b. Commercial forest (1) Natural	[22-27]	[28-32]
(2) Plantation	[33-37]	[38-42]
c. Nonforest	[43-48]	[49-53]
35. Volume of timber destroyed (MBM)	[54-59]	[60-64]

36. Total area when controlled	[65-70]
37. Fuel type prevailing on burned area	[71-76]
38. Topography (vicinity of origin)	[77]
39. Highest Fire Danger	[78-79]
40. Critical Weather Feature	[80]

Remarks (Continue on reverse if required)

Submitted (Signature) [Acting] District Ranger	Date	Approved (Signature) [Acting] Forest Supervisor	Date

Figure 4a.—*Front of the 1970 Forest Service Individual Fire Report, Form 5100-29.* 5100-29 (10/69)

Value of Resources Damaged or Destroyed (Code in hundreds of dollars)		N.F. LANDS (1)		OTHER LANDS (2) INSIDE FS PROTECTION	
		Dollars	Code	Dollars	Code
41. Timber			[11-15]		[16-20]
42. Other (non-timber)					
a. Watershed			[21-25]		[26-29]
b. Recreation			[30-34]		[35-38]
c. Range & Wildlife					
d. Improvements					
e. Other non-timber					
f. Total non-timber (a to e incl.)			[39-43]		[44-48]
43. GRAND TOTAL (Items 41 and 42f)					
44. Acres burned by Value Class	Value Class		Acres		Acres
	[49] –		[50-54]		[55-59]
	[60] –		[61-65]		[66-70]
	[71] –		[72-75]		[76-79]

GPO 888-978

Figure 4b.—*Back of the 1970 Forest Service Individual Fire Report, Form 5100-29.*

Table 1.—*Fire location items reported on USDA Forest Service fire reports from 1905 to 1981*

Fire location	1905-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1981
State			X	X	X	X	X	X
County			X	X	X	X	X	X
Region			X		X	X		
Forest	X	X	X	X	X	X	X	X
District			X	X	X	X	X	X
Sec.-Twp.-Range			X	X	X	X	X	X
Latitude-Longitude							X	X
Map			X	X	X	X	X	X
At Discovery[1]		X	X	X	X	X	X	X

[1]This refers to land either inside or outside Forest Service protection boundaries.

In addition to fluctuations in report size, changes in titles and form numbers and other modifications since 1905, fire report content has also been revised. Basically, 14 general categories of fire information have been reported fairly consistently: fire name, fire number, location, size class, cause, date started or discovered, fire occurrence and suppression times, environmental conditions, fire behavior and size increase, suppression forces and activities, acres burned, fire damages, remarks, and signature(s) of officer(s) approving a report. Within most of these categories the kind and amount of information reported changed from decade to decade. Table 1, for instance, shows the range of fire location items reported from 1905 to the present. Initially, a simple written description was used (e.g., "2½ miles Northwest of Goodells Creek Bridge"), but as more detailed and accurate reporting became necessary, the amount of required fire-location information increased.

Fire-cause classifications were also expanded over the years to identify in greater detail the primary causes of wildfires and the persons responsible for them. Because these cause categories have been treated separately in another paper, their historical development and use will not be discussed.[3]

To gauge the efficiency and, in part, the effectiveness of suppression efforts, the times at which various fire activities occurred were documented on wildfire reports (table 2). Fire times reported with the greatest frequency from decade to decade include origin, discovery, reported, first attack, reinforcements, control, and fire mopped up and/or out. Information such as who discovered the fire, who reported it, or who received the report accompanied the time data during most of the report's history. Although 20 different categories of elapsed times, calculated from fire occurrence and suppression times, have been used since 1920, no more than 12 were documented on a fire report in any given decade. As fire control activities became increasingly organized and complex, managers needed more information to assess fire behavior. As a result, beginning in 1920, environmental conditions such as cover and fuel types, fire-danger indicators, weather, and topography were incorporated on individual fire reports (table 3). Slope, aspect, and elevation were reported continuously for 60 years.

In conjunction with environmental conditions, fire behavior and fire size at various stages of suppression were reported (table 4). This information enabled fire control managers to gauge the efficiency of their suppression efforts and predict when such efforts would be required.

The number and type of suppression forces used on a wildfire, the quantity of suppression effort (work-hours) required, achievements (measured in terms of line construction), costs, and other related data have been documented to some degree on fire reports since 1905 (table 5). Items most commonly reported include number of people at first attack, the number of reinforcements, total number of workers, and fire suppression costs. By 1970, work-hour and line construction data were no longer reported.

Reporting acreage burned and fire damages grew into a complex process over the years, particularly in the 1920's and 1930's. In 1905, for example, only acres of timber and the total area burned were documented. By 1930, however, the report also included acreages of nonproductive forest, mature or merchantable timber, reproduction or young growth, cutover areas and slash, stocked and unstocked miscellaneous areas, livestock forage, complete kill in

[3]*See Donoghue, Linda R. Classifying wildfire causes in the USDA Forest Service: problems and alternatives. Res. Note NC-280. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 5 p.*

Table 2.—*Fire occurrence and suppression times reported on USDA Forest Service fire reports from 1905 to 1981*

Fire occurrence and suppression times (Date/hour/minute)	1905-1909[1]	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1981
Origin			X	X	X	X	X	X
Discovery	X	X	X	X	X	X	X	X
Reported		X	X	X	X	X	X	
Departed			X	X			X	
Arrival			X	X				
First attack	X	X	X	X	X	X	X	X
Reinforcements			X	X	X	X	X	X
Fire corralled				X				
Fire controlled			X	X	X	X	X	X
Fire mopped up/out	X	X	X	X	X	X	X	X
Time when maximum number of workers were on the line					X			
Time when maximum number of workers were mobilized					X			

[1]Only the date was reported.

each timber type, and acres burned due to avoidable errors in fire control methods. All this information was required for each major timber type in which the fire occurred on National Forest land, other lands inside the forest, and protected and unprotected lands outside the forest boundary. Similarly, damage information increased from the amount and value of timber destroyed to include quantity and value of other resources lost to a wildfire. Although the content and format of this information changed from decade to decade, some patterns do emerge:

- Generally, acreage and damage information was recorded in tabular form with ownership categories (e.g., National Forest land, private lands inside, outside lands protected or unprotected) on one axis and resource categories (e.g., timber, range, wildlife, recreation) on the other.

- Acreage burned was divided primarily into commercial, noncommercial, nonforest, and young-growth or reproduction land categories.

- Damages were divided into two basic categories, timber and nontimber, with the former receiving the greatest emphasis, particularly from 1905-1940. During that time, detailed accountings of damages to forest land and plant growth under different stages of development were required. The amount of rangeland burned was the only nontimber resource given major recognition.

Table 3.—*Environmental conditions reported on USDA Forest Service fire reports from 1905 to 1981*

Environmental conditions	1905-1909[1]	1910-1919[1]	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1981
Cover and fuel types								
Cover type-origin					X	X	X	X
Cover type-prevailing							X	
Fuel type-origin			X	X	X			X
Fuel type-prevailing						X	X	X
Worst fuel type					X			
Specific fuel-origin/spread			X	X		X	X	
Fire-danger & weather								
Fire-danger rating classes or indices					X	X	X	X
Windspeed			X	X	X	X		X
Topography								
Vicinity of origin/ placement on slope				X			X	X
Slope			X	X	X	X	X	X
Aspect/exposure			X	X	X	X	X	X
Elevation			X	X	X	X	X	X

[1]Not reported.

Table 4.—*Measures of fire behavior and size increase reported on USDA Forest Service fire reports from 1905 to 1981*

Measures of fire behavior and size increase	1905-1909[1]	1910-1919[1]	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1981
Fire behavior								
Character of fire on arrival			X	X	X	X	X	
Rate-of-spread							X	
Fire-size increase								
Area when discovered			X	X	X	X	X	
Area on arrival/attack			X	X	X	X	X	
Area when controlled			X	X	X	X	X	X
Perimeter at first attack				X	X			
Perimeter when corralled				X				
Perimeter when controlled			X	X	X	X	X	
Perimeter increase/hr (origin-discovery/attack)					X	X	X	

[1]Not reported.

- The 1930 Individual Fire Report, the first to include nontimber damages other than forage, established most of the categories used in subsequent years. Then, as now, nonforest damages were reported strictly in terms of dollar values.

The different approaches used since 1905 to report wildfire damages reflect the frustrations still evident today, caused by the lack of satisfactory methods for measuring impacts of wildfires on forest resources.

Table 5.—*Suppression forces and activities reported on USDA Forest Service fire reports from 1905 to 1981*

Suppression forces and activities information	1905-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1981
Discovery/lookout tower information				X	X	X		
Travel								
Distance traveled to fire			X	X	X	X		
Method of travel			X	X		X		
Suppression forces								
Number of people at first attack			X	X	X	X	X	X
Type of first attack						X	X	X
First attack by Forest Service or other					X			
Number of people as reinforcements			X	X	X	X	X	X
Type of reinforcements						X	X	X
Total number of people	X	X	X	X	X	X	X	X
Suppression effort								
Work-hours to control			X	X		X	X	
Work-hours to mop-up			X	X		X	X	
Work-hours-total (on the line)			X	X	X			
Line built								
Total line built by hand			X	X		X		
Total line built by equipment						X		
Total chains held line					X			
Line held by equipment						X		
Total chains lost line			X	X	X			
Average chains held line or line built/work-hour				X	X			
Percent perimeter worked by equipment							X	
Suppression costs/cost class	X	X	X	X		X		X

THE 1970 INDIVIDUAL FIRE REPORT, FORM 5100-29

Content

The individual fire report (Form 5100-29) currently used by the USDA Forest Service contains 44 numbered items of information and six unnumbered items[4] used primarily for administrative purposes (fig. 4a, 4b). Not all 44 items are required for each wildfire, however; items 1-33 are reported for Class "A" fires, 1-34 for Class "B" fires, and 1-44 for Class "C" to "G" fires.

The content and design of this wildfire report are based largely on historical precedent. Well over half of the items (64 percent) have been reported continuously for 60 years or more (25 percent since 1905 and 39 percent since 1920), and nearly all of the remaining have been on Forest Service fire reports for 20 to 40 years. Only two, watershed number and value class at origin, are unique to the current form. Perhaps the greatest change in form content is in measures of fire behavior and size increase. In the past, five to seven measures were reported each decade, but now only one, total area when controlled, is on the form (table 4).

Data Use and Reliability

The individual fire report is one of the most frequently used data sources on wildfires in the country. (An average of 13,200 reports are filed each year.) According to the Forest Service Handbook, FSH 5109.14 (1970), "Form 5100-29 provides important data for planning and administering fire control activities, and for the study of techniques and problems by research and administrative personnel." Data are used not only in preparation of annual statistical summaries, but also (1) as a base for fire planning and allocation of funds; (2) to evaluate fire prevention programs; (3) to gauge fire suppression efficiency; (4) to assist in fire damage appraisal; and (5) to evaluate the National Fire-Danger Rating System (Deeming *et al.* 1977).

Because a large proportion of fire control and fire prevention planning in the Forest Service is based on fire report information, accurate and reliable data from the 5100-29's are essential. The reliability of fire report information is often questioned, however, indicating a lack of confidence in some of the report entries and resulting data summaries (Chandler 1960, Simard *et al.* 1973, Main and Haines 1974). Of the many factors affecting data reliability, perhaps the two most important are (1) the methods used to acquire and record data and (2) the attitudes of individuals completing the fire report (Simard *et al.* 1973).

The first of these two factors depends not only on the nature of the information sought, but also on the priority and immediacy given to reporting wildfire data. According to Simard *et al.* (1973):

> The information recorded [on a fire report] can vary from a precise observation to an almost random guess. Assuming a total lack of bias on the part of the reporting individual, certain information is normally quite exact. Directly observed data such as fire location and time of detection are normally highly reliable and precise data.

The authors go on to say that other observations are based on measurements that have varying degrees of precision (e.g., volume of forest products destroyed by a large fire or final area of large fires). A few factors can be naturally highly variable or imprecise (e.g., fire cause and time of ignition).

> There is another significant factor pertaining to the method of recording information which must be considered. Field personnel are concerned with fire control—not data acquisition. There are always other pressing duties which demand an individual's time and attention in addition to accurately recording information about a fire. This applies both during and after the fire. While some relatively straightforward information is normally recorded in real time, much of the more complex data may be based on memory and perhaps a few scribbled notes. Under such circumstances some loss of accuracy and detail is unavoidable (Simard *et al.* 1973).

The second factor, attitudes of individuals completing a fire report, is also important to consider when determining the quality of data reported on the 5100-29's. For example, according to Simard *et al.* (1973), in agencies where supervisors expect complete and accurate information on fire reports, individuals are likely to have good attitudes toward filling out the forms. However, if individuals filling out fire reports know that checks on their accuracy are rarely made, that their supervisors do not value proper completion of the fire reports, or that truthful reporting can lead to repercussions from superiors, they may be careless, untruthful, overly hasty, or resentful while recording information.

[4] *Unnumbered items include fire name, ranger fire number, region fire number, remarks, and submitted and approved signatures and dates.*

Simard warns that overlooking the attitudes of individuals when they're completing the form could invalidate results based on analyses of data from these reports.

Realizing that the methods of data acquisition and recording as well as the attitudes about fire reporting may affect the quality of fire report information, we formulated a study to examine the impacts of both on data reliability. The study was also designed to obtain ideas, comments, and suggestions about various aspects of fire reporting from field personnel.

METHODS

During the 1974 and 1975 fire season, we interviewed Forest Service employees on more than three-fourths of the Ranger Districts in 12 northeastern (Region-9) National Forests. We used two interview schedules developed with the help of a survey research specialist from Michigan State University in East Lansing, Michigan. The first schedule was designed to assess respondents' confidence, measured on a scale from "Very Certain" to "Not at All Certain," in the accuracy of their fire report entries. We selected the three most recent Class A, B, and C-or-larger fire reports, if available, from District office files, and, using the forms to aid recall, interviewed the person(s) responsible for supplying the data on the three fire reports. A total of 145 reports (nearly 10 percent of the total Region-9 fire reports filed in 1974 and 1975) were examined for data accuracy. With this sample size, the confidence interval is ± 8 percent of observed values at the 95 percent level. Most of these reports (88 percent) were for Class A and B wildfires. The 62 respondents to this first questionnaire included Forestry Technicians (31 percent), Other Resource Assistants (26 percent), Rangers (16 percent), District Clerks (11 percent), Foresters (10 percent), and Assistant Rangers (6 percent).

The second interview schedule was designed primarily to assess attitudes of individuals filling out the forms. In addition to collecting attitude data, however, we also tried to examine other report-related issues and problems, such as fire-report use on Ranger Districts, the priority of fire-report completion in relation to other District activities, and the time required to complete the fire reports. The 62 respondents to the second interview (not necessarily the same people as above) were Forestry Technicians (35 percent), Rangers (27 percent), Other Resource Assistants (23 percent), District Clerks (10 percent), and Assistant Rangers (5 percent). Because the Ranger Districts were chosen at random and the visited sample was large (77 percent of all Districts), the chance that attitudes and opinions at the unsampled Districts are different from those at the sampled Districts is only 0.03 at the 95 percent level.

RESULTS AND DISCUSSION OF FIELD INTERVIEWS

Respondents' confidence in the accuracy of their fire-report entries was generally quite high. Most of the individuals interviewed were very certain of their entries for equipment/personnel (92 percent),[5] fuel/site description (86 percent), and fire times (86 percent if item 14 is excluded) (fig. 5). The number of respondents expressing high certainty in remaining entries, however, gradually decreased: acreage/timber destroyed (75 percent), fire danger/weather (65 percent), value of resources damaged or destroyed (61 percent), and fire causes (59 percent). Overall, though, more than half of the respondents said they were very certain of their entries for items 10-44 except for Item 14, time of fire origin. Using a confidence interval of ± 8 percent of the average percentage for each group, we found that groups A, B, and C (excluding Item 14) are significantly different from groups E, F, and G (fig. 5). Therefore, if we assume that degree of certainty indicates degree of data reliability, those using data from fire reports can place more confidence in entries describing equipment, personnel, fire times, fuels, and site factors than in the rest of the entries.

In conjunction with "certainty" data, we also recorded respondents' years of fire reporting experience, source of information for each of the items 10-44, and times involved in completing each fire report, thinking that these factors may affect data reliability. We found that:

- Years of fire reporting experience ranged from less than 1 year to 30 years, with a median of 7 years.
- In addition to collecting and supplying their own data, respondents used other information sources for their fire report entries. For example, in addition to maps and weather records, they gathered data from dispatchers, aircraft patrol pilots, fire wardens, local fire departments, and seasonal or permanent local residents. Nearly 86 percent of the fire report data, however, were supplied by Forest Service technicians and foresters.

[5]*The percent in parentheses is the average percent of respondents in that group.*

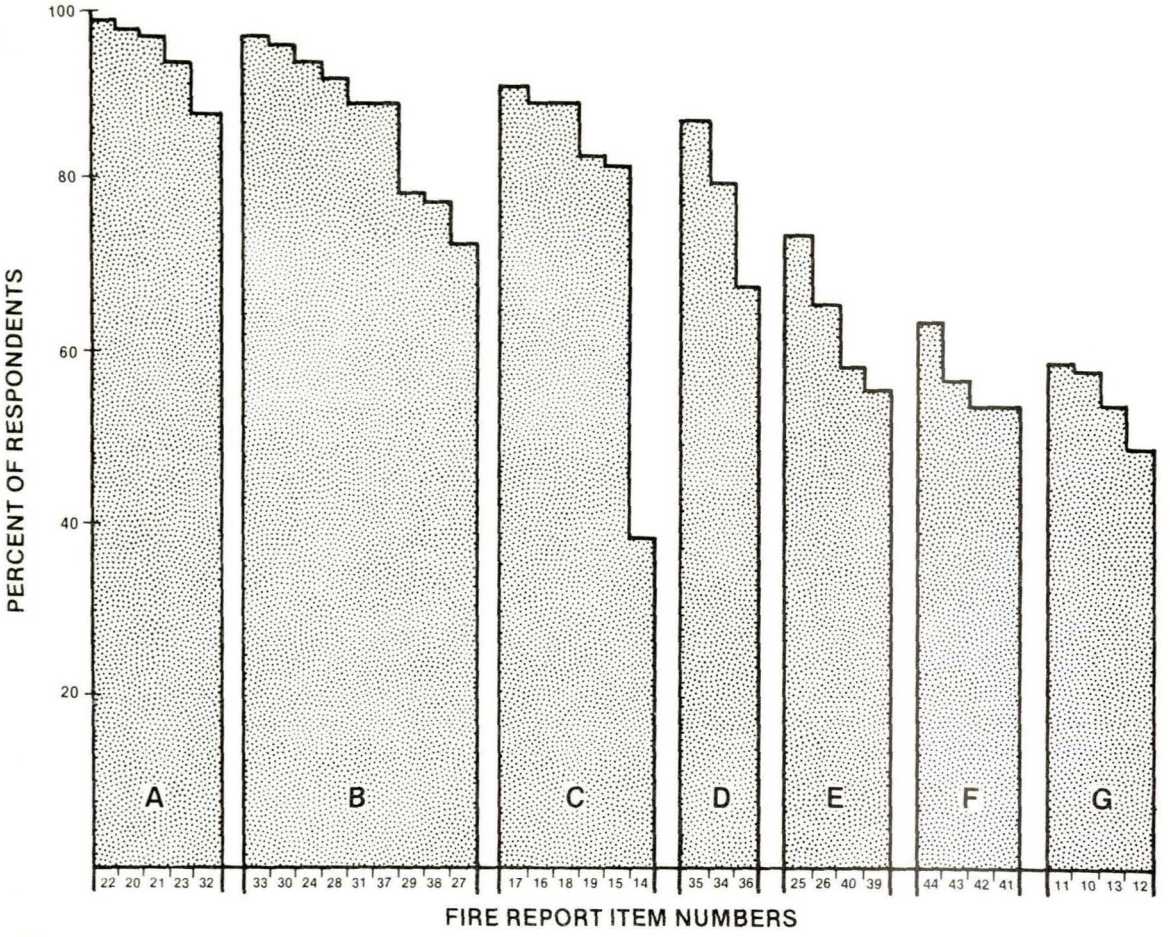


Figure 5.—*Percent of respondents who were very certain of the accuracy of their fire report entries for items 10-44. Fire report items and numbers corresponding to those on the current (1970) Forest Service Individual Fire Report, Form 5100-29, are grouped into seven subject areas.*

A—Equipment and personnel; B—Fuel and site description; C—Fire times; D—Acreage and timber destroyed; E—Fire danger and weather; F—Value of resources damaged or destroyed; and G—Fire causes.

- Regardless of fire size class, more than half of the fire reports were ready for an approving officer's signature in a day or two and more than three-fourths were ready within a week after the fire, indicating that reports were generally given prompt attention when the data were still relatively "fresh" in people's minds. The amount of time actually spent on a fire report, including time spent investigating the fire cause, collecting information, and filling out the form, varied widely. Investigation times ranged from 0 minutes to approximately 20 hours (median = 40 minutes), collecting data and filling out the form required from 5 minutes to 8 hours (median = 2 hours), and the total time to do all three activities ranged from 30 minutes to 26 hours (median = 3 hours). As expected, Class A and B fire reports generally required less time to complete than C and D reports; four out of five A/B 5100-29's were finished in 4 hours or less, but only one-third of C/D reports were completed in the same time period. None of the variables—years of reporting experience, source of fire information, or form preparation times—showed significant correlations with respondents' certainty in fire report entries.

As an independent check on data accuracy, we examined each of the 145 fire reports for coding errors. Nearly half of them (47 percent) had one or more errors due primarily to miscoding written information. This error rate is compatible with historical analyses conducted in the 1940's and 1950's.[1] For example, a Region-3 work simplification study conducted in 1944 showed that 54 percent of the Class A and B fire reports had similar coding or entry

mistakes. Although errors occurred in 17 different fire report items on the current (1970) 5100-29, most of them were concentrated in Items 14-18 (fire times) and in Items 30 and 31 (cover and fuel types). Errors were not only made in information generally considered highly reliable, but they were also undetected, indicating that better fire report instructions are needed, coding procedures should be simplified, and more time must be devoted to data verification.

People with fire reporting responsibilities generally have attitudes and opinions about the 5100-29 that may affect how the report is processed and used or what priority it has in relation to other activities. They are also in an excellent position to identify problems with the reporting system and recommend useful changes from a field perspective. Our findings show that:

- More than half of the respondents had a positive attitude toward the 5100-29, primarily because of the valuable data the form supplies. Nearly three-fourths said it had a useful purpose—to supply information that would aid managers at various administrative levels and also facilitate research, fire planning, fire prevention, and historical data analysis. The positive attitude was also attributed to the form itself; it was simpler to complete and better than the form it replaced.

- Those who reported negative attitudes toward the 5100-29 (one-fourth of the respondents) were dissatisfied with it for the following reasons, listed in descending order of importance: (1) it requires a great deal of time and effort to fill out; (2) it contains ambiguous and useless items; (3) the format and coding are too complicated and confusing; (4) the form design and arrangement impair readability; and (5) some fire report entries are inaccurate because it's difficult to reduce complex events to simple codes. Negative reactions to the fire report also stemmed from pressure to submit the form on time and from the emphasis it received relative to its perceived importance.

- Four-fifths of the respondents used some of the information (although it was often rather minimal) from the 5100-29 on the job. Data were used primarily to determine fire occurrence patterns and as an aid to fire planning and prevention. They were used less frequently as input into law enforcement analyses and court cases and in fire-danger assessment.

- Completion of the 5100-29 had high priority on most Ranger Districts; only 7 percent of those interviewed said it received low priority and another 23 percent assigned it medium priority. Even though the form generally received immediate attention after a wildfire, nearly three-fourths of the respondents reported delays in preparing it during peak fire periods. Although one District reported delays as long as 35 days, most submitted the forms within a week after the fire.

- District personnel were asked to indicate the degree of difficulty (ranging from not at all difficult to very difficult) encountered in understanding the fire report instructions, obtaining data for each item, properly entering data on the form, and finding time to complete the 5100-29. In all cases, close to half of the respondents said these tasks were not too difficult, although finding time and obtaining data for each item were judged reasonably difficult by more than a fourth of those interviewed. Overall, understanding the instructions was the least difficult and finding time to complete the form was the most difficult.

- The question received most enthusiastically by District personnel was how they would improve the 5100-29. Of the 87 percent who said it needed improvement, most offered suggestions for changes in form content and design (see the Appendix).

- Along this same line, we asked if other fires should be included on the fire report. About 25 percent said they would like to see nonstatistical fires, prescribed fires, and managed wildfires, singly or in combination, reported on the 5100-29.

- Only 25 percent of the respondents surveyed the form in depth for completeness and accuracy before the final signature. Forty percent partially examined the form, and one-third gave the form only a cursory review. This may account, in part, for the undetected coding errors discussed earlier.

Some relations between variables that we examined were not significant. In addition to those already mentioned, we found that respondents' attitudes about fire reporting were unrelated to their years of fire reporting experience, to their use of fire-report information on the job, and to the priority the 5100-29's received in relation to other District activities. Our analysis also indicated that use of fire-report information had no correlation with the perceived purpose of the form or its priority on the Ranger Districts. Low correlations between these variables may be due in some cases to poorly formulated questions, but on the whole, we can find no evidence that relations between these variables exist.

SUMMARY AND CONCLUSIONS

The USDA Forest Service Individual Fire Report, Form 5100-29, reflects a long tradition of fire reporting begun in 1905; both its content and design are based largely on historical precedent. Because the report provides valuable wildfire data used for various purposes by operational, administrative, and research personnel, the reliability of the information on the form is a continuing concern. We found that fire report information is generally reliable and that, as Simard *et al.* (1973) suggested, directly observed data are more reliable than hard-to-observe data such as value of resources damaged or destroyed or wildfire causes. Even though not all fire report data are recorded in real time, our study indicates that data reliability does not decrease significantly as the time between fire occurrence and report form completion increases. It would seem, as Simard *et al.* (1973) contend, that some loss of accuracy and detail is unavoidable, but apparently it's not serious enough to cause field personnel to lower their confidence in their fire report entries. These results, however, may be due to a bias in our sample, in that the time from fire occurrence to form completion was generally short (1 to 7 days).

The median time required to complete a fire report (3 hours) may have a large impact on the total workload of Ranger Districts that have many fires. We believe that a sudden increase in workload can influence the quality of data entered on the fire report. Attention to detail and accuracy might be sacrificed as efforts to save time and process the reports quickly take precedence. Less effort may be given to fire-cause investigation, thorough documentation, and careful measurement of other fire-related parameters. As a result, best "guesstimates" may be entered on the report.

Given the high number of coding errors, fire report validation is still a problem, indicating a need for quality control at higher administrative levels. Fire report items most frequently miscoded, especially fire times and cover and fuel types, should be examined more closely for errors.

The positive attitudes toward fire reporting expressed by so many of the District personnel are encouraging, and the high percentage of people finding the fire reports useful indicates that they're seeing tangible results from their reporting efforts. Perhaps these positive attitudes and support for fire reporting have an effect on the reliability of the information entered on the fire report. On the other hand, people with negative responses to the 5100-29 had concrete reasons for their attitudes which managers can directly address if they wish to bring about attitude changes in this particular group. Changes could be made in form design or in management directives and requirements, for instance, that would reduce the time and effort needed to fill out the form, make the reporting system simpler to use, or clarify the need for certain types of information routinely reported.

Only 7 percent of the Ranger Districts considered the 5100-29 a low priority item, indicating that the Regional Office mandate, requiring that each report be sent in within 10 days of the fire, was effective. On the negative side, this mandate may also have been partially responsible for the many coding errors made in haste in order to submit the form to the Regional Office on time. The revised regional fire report instructions now provide a little more flexibility; the original copy of the 5100-29 is due not later than the 10th of the month following the month the fire occurred.

Finally, District personnel, ultimately responsible for the data entered on the 5100-29, have excellent ideas and suggestions about fire reporting that should not be ignored by those redesigning the system, making simple changes, or in some other way altering the form and its contents. Their day-to-day experiences and frustrations with the form are worth noting and can serve to improve both the quality of data obtained from the fire reports and the ease and efficiency with which data are entered on the form.

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APPENDIX

Examples of Fire Report Form Content and Design Changes Recommended by District Personnel

Content changes

1. Reduce the number of items reported for Class A and B fires.
2. Consolidate Items 10-12 (fire causes) and re-design them to reflect actual field situations.
3. Re-design cover and fuel types to facilitate easier, accurate reporting.
4. Emphasize or require written remarks to supplement coded data.
5. Include degrees of certainty with difficult-to-measure parameters such as fire cause.
6. Incorporate the law enforcement report to reduce repetitious reporting.
7. Change Item 21 (First Attack by) so that a combination of first attack forces can be reported.
8. Clarify the definition of "Amount" entries required for Items 21-22 (First Attack by and First Reinforcements).
9. Incorporate additional weather features contributing to fire danger.
10. Clarify differences between statistical and non-statistical fires.
11. Eliminate repetitious items such as 26 & 40 (weather feature); 30, 31, & 37 (cover and fuel types); and 34 & 36 (acreage).
12. Include an item recording wildfire benefits.
13. Adjust Item 38 (Topography—vicinity of origin) categories to reflect Region-9 topography.
14. Use one report for string sets, but include an item giving the total number of incendiary or railroad fire sets.
15. Eliminate latitude, longitude, and watershed number.
16. Include provisions for changing or correcting entries after the report has been submitted.
17. Incorporate fire behavior items.
18. Eliminate items that are not used in fire management planning or in statistical reports.

Design changes

1. Consolidate most important information, such as date and cause of fire and acreage burned, in one area on the form.
2. Divide the form into two sections—one for write-in entries; one for coded entries.
3. In FSH 5109.14, Individual Fire Report Handbook, compile one set of fire report instructions that sequentially incorporates regional supplements and fire report information from other Forest Service manuals.
4. Re-design the form for easy typing. It should be one-sided with proper spacing, item sequencing, and directions that eliminate the use of a template.
5. List acreage categories corresponding to each size class.
6. Use color-coded snap sheets indicating form distribution.
7. Increase space available for narratives.
8. Change map size to 4 inches to the mile.
9. Eliminate write-in data; record only numerical codes or check one of several alternatives for each item.

Donoghue, Linda R.
The history and reliability of the USDA Forest Service wildfire reports. Pap. NC-226. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 15 p.

Traces the history of USDA Forest Service fire reports, examines the most recent report, Form 5100-29, and discusses the reliability of information recorded on the 5100-29, factors influencing data accuracy, and reactions of Ranger District personnel to wildfire reporting.

KEY WORDS: Form design, fire reports, wildfire reporting.